

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

ATTORNEY'S DOCKET NUMBER

TRM TR990031

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

10/089558

INTERNATIONAL APPLICATION NO.
PCT/US00/26901

INTERNATIONAL FILING DATE
29 September 2000

PRIORITY DATE CLAIMED
30 September 1999

TITLE OF INVENTION

Method and Apparatus for Molding Plastic Materials with a Metallic Appearance

APPLICANT(S) FOR DO/EO/US

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Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☒ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (24) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☒ has been communicated by the International Bureau.
 - c. ☒ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A copy of the International Search Report (PCT/ISA/210).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☒ A change of power of attorney and/or address letter.
19. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
20. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
21. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
22. ☒ Certificate of Mailing by Express Mail
23. ☒ Other items or information:

Copy of Amendment under Article 34

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR 1.107) 10/089558		INTERNATIONAL APPLICATION NO. PCT/US00/26901		ATTORNEY'S DOCKET NUMBER TRM TR990031	
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24. The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) : <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 <input checked="" type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 <input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00				CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$710.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). <input type="checkbox"/> 20 <input type="checkbox"/> 30				\$0.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	25 - 20 =	5	x \$18.00	\$90.00	
Independent claims	2 - 3 =	0	x \$84.00	\$0.00	
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>				\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$800.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$0.00	
SUBTOTAL =				\$800.00	
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30 +				\$0.00	
TOTAL NATIONAL FEE =				\$800.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable). <input type="checkbox"/>				\$0.00	
TOTAL FEES ENCLOSED =				\$800.00	
				Amount to be:	\$
				refunded	
				charged	\$

a.	<input checked="" type="checkbox"/>	A check in the amount of \$800.00 to cover the above fees is enclosed.
b.	<input type="checkbox"/>	Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees. A duplicate copy of this sheet is enclosed.
c.	<input checked="" type="checkbox"/>	The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-2121 . A duplicate copy of this sheet is enclosed.
d.	<input type="checkbox"/>	Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

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 REGISTRATION NUMBER

 April 1, 2002
 DATE

METHOD AND APPARATUS FOR MOLDING PLASTIC MATERIALS
WITH A METALLIC APPEARANCE

The present invention relates to a method and apparatus for molding plastic materials with a metallic appearance and, more particularly, to an injection mold having interchangeable gate inserts that supply molten thermoplastic material into a mold cavity.

As used in this specification, a colorant is any material that can impart color to the medium in which it is used. The colorant may be insoluble or soluble in the medium. Generally, colorants may be divided into two broad categories; pigments and dyes. As used in this specification, a pigment may be organic or inorganic, natural or synthetic, and is generally insoluble in the medium in which it is used, while a dye is generally soluble in the medium in which it is used.

As used in this specification, a subcategory inclusive of pigments are pigments used to modify the optical characteristics of the medium in which they are used, such as light reflectivity, light refractivity, light absorbance, or light transmittance. A subcategory of pigments used to modify the optical characteristics of the medium in which they are used are light-reflective pigments. Light-reflective pigments include, but are not limited to, metallic pigments (also known as metallic-flake pigments) and glitter (also known as flitter or spangles). A metallic pigment is a particle or flake, generally of metal or alloy, used to modify the optical characteristics of the medium, such as reflectivity, or to achieve a metallic appearance. The metals most commonly used include, but are not limited to, gold, silver, aluminum, copper, bronze, and zinc. Materials other than metals which may be used to achieve a metallic appearance include minerals (e.g. mica) or glass. These materials generally are all used in flake form.

Typically, products molded from plastic materials include, but are not limited to, automotive body panels, fascias and claddings. In the automotive industry, a preferred method of forming such products is injection molding of a plastic material, preferably that of a thermoplastic composition. Injection molding is preferred over other plastic forming techniques given its combination of high volume production with relatively low cost materials.

After molding, or post-molding, often a metallic appearance is applied to such automotive products in the form of a coating. Typically, this metallic appearance is

1 achieved via a painting operation via the use of a metallic paint. A metallic paint is a
2 paint which incorporates the use of a metallic pigment defined above.

3 Recently, there has been a desire to eliminate the post-molding application of
4 a metallic appearance, such as via metallic paint, to such automotive products. There
5 has been a desire to incorporate the metallic appearance for such automotive products
6 during the forming, or molding, of the product itself. The incorporation of the
7 metallic appearance for such automotive products during the forming of the product is
8 desired to reduce cost, and the emission of potentially harmful volatile organic
9 compounds (VOCs) into the atmosphere common to the painting process.

10 More particularly, there is a desire to incorporate the metallic appearance for
11 such automotive products into the composition used for forming, or molding, the
12 automotive product itself. There has also been a desire that the composition of the
13 automotive product comprise a plastic material, preferably a thermoplastic material.
14 Furthermore, there also has been a desire to form the above preferred thermoplastic
15 material by a molding process, and, more particularly, an injection molding process.

16 More recently, attempts have been made to incorporate a metallic appearance
17 into automotive products via thermoplastic injection molding. It has been found,
18 through experimentation, that an acceptable level of quality of the molded automotive
19 product can be achieved with an injection molding process and thermoplastic
20 compositional alterations. Such is demonstrated by the 1999 Jeep Grand Cherokee
21 Laredo front fascia, rear fascia and claddings, manufactured using an injection
22 molding process with Solvay Engineered Polymers' Sequel 1440 grade of
23 thermoplastic olefin (TPO) composition.

24 However, it has also been found that injection molding process and
25 compositional-alterations required to produce an acceptable level of quality may vary
26 significantly with each particular thermoplastic composition employed. More
27 specifically, it has been found that, when different metallic pigments are used to
28 achieve various metallic appearances and/or colors, the injection molding process and
29 compositional alterations required to produce an acceptable level of quality between
30 compositions may vary significantly. It has also been found that, in some cases, that
31 even altering the injection molding process and thermoplastic composition, within
32 acceptable limits, still may not produce an acceptable level of quality. Typically,

1 such products did not produce an acceptable level of quality due to the presence of a
2 differing metallic appearance on different locations on the surface of the product.
3 This differing metallic appearance most noticeably appears in areas of the surface
4 occupied by weld lines versus those areas of the surface without weld lines. Weld
5 lines (also known as knit lines, flow lines, or weld marks) in a molded plastic product
6 mark the meeting of different plastic flow fronts within a mold. According to
7 Whittington's Dictionary of Plastics, 3rd Edition, the flow fronts may have cooled and
8 skinned over before meeting, or had too little time in the molten state for
9 interdiffusion of molecular segments across the interface.

10 As a result of the above difficulties, apparatus alterations, in addition to
11 injection molding process and thermoplastic composition alterations, were the subject
12 of experimentation. Specifically, apparatus alterations focused on alterations to the
13 injection mold used for the injection molding process. More specifically, injection
14 mold alterations focused on gate design, such as size, configuration, and location. In
15 injection molding, the gate is the channel through which molten plastic flows from the
16 runner into the mold cavity.

17 From experimentation, it was found that altering the injection mold gate
18 design, in addition to altering the injection molding process and thermoplastic
19 composition, produced an acceptable level of quality. In other words, gate design had
20 an effect on controlling different plastic flow fronts and weld line formation within
21 the mold cavity such that the metallic appearance across the surface of the part could
22 be made more uniform as to produce an acceptable level of quality. However, having
23 different injection mold gate designs for each thermoplastic composition could only
24 be achieved by means of significant injection mold alterations requiring substantial
25 time not suitable for high volume production. Alternatively, the requirement of
26 injection mold alterations could be eliminated with the fabrication of a different
27 injection mold for each thermoplastic composition. However, the cost of different
28 injection molds for each thermoplastic composition is prohibitive given the size of
29 automotive products. Consequently, what was needed was an injection molding
30 process, and more particularly, an injection mold apparatus in the form of an injection
31 mold, which would facilitate quick, inexpensive gate design alterations to facilitate

1 high volume, low cost production of thermoplastic injection molded automotive
2 products with a metallic appearance.

3 An apparatus for molding plastic materials is provided comprising a mold having
4 a first mold section (12) and a second mold section (14) with a mold cavity (16) disposed
5 in between. A first gate design is provided by at least one first gate design mold member
6 (40), and a second gate design is provided by at least one second gate design mold
7 member. Preferably, date design mold member (40) is defined by two interchangeable
8 members 41 and 42. Also preferably, the first and second gate design mold members are
9 removably attachable to, and interchangeable on, at least one of the first or the second
10 mold sections (12, 14) to change from the first gate design to the second gate design. A
11 method for molding plastic materials is also provided comprising providing a mold
12 having a first mold section (12) and a second mold section (14) with a mold cavity (16)
13 disposed in between; providing a first gate design; forming a product in the mold cavity
14 (16) by providing a first plastic material through the first gate design; separating the first
15 mold section (12) and the second mold section (14); removing the product from the mold
16 cavity (16); changing from the first gate design to a second gate design; forming a
17 product in the mold cavity (16) by providing a second plastic material through the second
18 gate design. In the above manner, the formation of weld lines on the product may be
19 controlled.

20 Other advantages of the present invention will be readily appreciated, as the same
21 becomes better understood by reference to the following detailed description when
22 considered in connection with the accompanying drawings wherein:

23 FIG.1 is a perspective view of a mold apparatus and feed system with the mold
24 and feed system partially cut away;

25 FIG.2 is a top plan view of the molded article also showing the runner system and
26 the gate; and

27 FIG.3 is a side sectional view of a similar embodiment of the invention showing
28 a mold and feed system taken along a vertical plane through the runner and gate.

29 Referring to the Figures, wherein like numerals indicate like or corresponding
30 parts throughout the several views, an injection molding apparatus is generally shown at
31 10. The injection molding apparatus 10 includes first and second mold sections 12, 14
32 defining a mold cavity 16. Also, a material feed system 18 includes an elongated gate

1 portion 20 disposed along an edge of the mold cavity 16, the gate portion 20 being in
2 fluid communication with the mold cavity 16. The feed system 18 also includes a runner
3 portion 22 in direct fluid communication with the gate portion 20.

4 Now the invention will be described in greater detail. Preferably, the gate portion
5 20 and runner portion 22 are defined by two interchangeable members 41, 42 which are
6 separable from the first and second mold sections 12, 14 and occupy recesses 50, 52
7 thereof in a fixed, but removable manner known in the art such as bolts, screws or the
8 like (not shown). Although in other embodiments, the gate portion 20 and runner portion
9 22 may be defined by only one separate member (i.e. only one interchangeable member)
10 of one of the mold sections 12, 14.

11 Starting at the most upstream point in the feed system 18 of mold sections 12, 14,
12 the feed system first includes a drop 28. The drop 28 supplies the runner portion 22 with
13 molten plastic material and, more particularly, a thermoplastic composition.
14 Alternatively, the drop 28 may supply the gate portion 20 directly without the use of a
15 runner portion 22. This discussion does not treat injection molding elements upstream of
16 the drop 28 in mold sections 12, 14. Such elements might include, for example, a hot-
17 runner manifold and associated nozzles, etc. The exact manner in which molten material
18 arrives to the gate portion 20 is not important to the present invention; and in any case
19 various means for supplying molten plastic are well known to persons of skill in the art.
20 Also, the term "feed system" encompasses numerous embodiments. The feed system 18
21 may include heating elements or even a hot-runner sub-system. Alternatively, the feed
22 system 18 may simply include only a cold runner arrangement.

23 Extending horizontally away from the drop 28 downstream of the drop is a
24 runner portion 22. The runner portion 22 has two major sections, 22a and 22b. The
25 second section 22b, connects with the drop 28 and carries molten material away from the
26 drop 28 to first section 22a. The second section 22b of the runner portion 22 extends
27 toward the mold cavity 16 in a direction generally normal to the mold cavity 16 as shown
28 in FIG. 1. The first section 22a of the runner portion 22 extends more or less parallel to
29 the edge of the mold cavity 16, and so the first section 22a is somewhat perpendicular to
30 the second section 22b. The first section 22a is open along its length to supply material
31 to the gate portion 20 along its length. As shown in FIG. 2, the first sections 22a of the
32 runner portion 22 fans or tapers outwardly as it extends toward the gate portion 20.

1 Preferably, the runner portion 22 includes at least one, and preferably two, cold slugs 36
2 for trapping and storing any unmelted pieces of material passed through the runners.

3 The next element downstream of the runner portions is the gate portion 20. As
4 stated, the gate portion 20 extends along a significant portion of the edge of the mold
5 cavity 16. Thus, the gate portion 20 is sometimes referred to as an edge gate. As shown
6 in FIG. 3, an orifice 38 is defined at the gate portion 20. In other words, the gate portion
7 20 is smaller or narrower in dimension than the first section 22a of the runner portion 22.
8 The runner portion 22 tapers in dimension down to the gate portion 20. Experimentation
9 with the Solvay Engineered Products' Engineered Polymers' Sequel 1440 grade of
10 thermoplastic olefin (TPO) composition has an orifice 38 thickness between mold
11 sections 12, 14 in the range of 0.010" to the nominal thickness of the product, more
12 particularly from 0.010" to 0.060", and even more particularly preferred in the range
13 of 0.030" to 0.050", and in any 0.001" increment therebetween. The length of the
14 orifice 38 in relation to the thicknesses above preferably is in the range of 0.040" to
15 the nominal length of the product, more particularly from 0.250" to 10.0", and even
16 more particularly from 0.50" to 1.0", and in any 0.001" increment therebetween.

17 In operation, the mold sections 12, 14 close to define the mold cavity 16 and the
18 feed system 18. Then, the operator causes a first molten plastic material, preferably a
19 first thermoplastic composition, to flow into the feed system 18 into drop 28. The
20 material travels through the drop 28 to the runner portion 22 and the runners conduct the
21 material into the gate portion 20. The material from the runner portion 22 is initially
22 impeded from flowing into the mold cavity 16 by the narrower dimension of the gate and
23 begins merging and mixing upstream of the gate portion 20, and then continues to merge
24 and mix in the gate portion 20 as it moves into the mold cavity 16 once the feed system
25 along the gate is filled with material. Any unmelted pieces of material or other
26 impurities in unmelted particle form will be trapped and retained in the cold slugs 36.
27 Once the mold cavity 16 fills, the material can cool and harden. Then the mold sections
28 12, 14 can be separated and the molded article removed.

29 After the injection molding of product with the first plastic material is complete,
30 the mold sections 12, 14 are separated and interchangeable members 41, 42 are removed
31 from the recesses 50, 52 thereof. Thereupon, new interchangeable members, which
32 correspond to an acceptable gate design for a second plastic material, are inserted into the

1 recesses 50,52 and fixed to mold sections 12, 14 in a similar manner to interchangeable
2 members 41,42. It should be understood that each plastic material may have its own
3 interchangeable members to define its own gate design 40 as required to manufacture
4 acceptable products. Once the new interchangeable members 41,42 have been fixed
5 within the recesses 50, 52 of mold sections 12,14, the apparatus 10 is now ready for
6 processing the second plastic material.

7 The invention has been described in an illustrative manner, and it is to be
8 understood that the terminology which has been used is intended to be in the nature of
9 words of description rather than of limitation.

10 Obviously, many modifications and variations of the present invention are
11 possible in light of the above teachings. Therefore, it is to be understood that within the
12 scope of the appended claims the invention may be practiced otherwise than as
13 specifically described. Moreover, the reference numerals are merely for convenience and
14 are not intended to be in any way limiting.
15

We claim:

1. An apparatus for molding plastic articles having pigments used to modify light reflectivity comprising:
 - a mold having a first mold section (12) and a second mold section (14) with a mold cavity (16) disposed between the first and the second mold sections (12, 14);
 - a first gate design for providing a first plastic material to the mold cavity (16) provided by at least one first gate design mold member (40);
 - a second gate design for providing a second plastic material to the mold cavity (16) provided by at least one second gate design mold member;
 - the first and second gate design mold members removably attachable to at least one of the first or the second mold sections (12, 14);
 - the first and second gate design mold members interchangeable on at least one of the first or the second mold sections (12, 14) to change from the first gate design to the second gate design.
2. The apparatus for molding plastic materials of claim 1 wherein the mold comprises an injection mold.
3. The apparatus for molding plastic materials of claim 1 wherein the first gate design comprises an edge gate.
4. The apparatus for molding plastic materials of claim 1 wherein the second gate design comprises an edge gate.
5. The apparatus for molding plastic materials of claim 1 wherein at least one of said first or second mold sections contains a recess and said first or second gate design mold member is insertable in said recess.
6. The apparatus for molding plastic materials of claim 1 wherein the first gate design mold member is removably attachable to the first or the second mold section by threaded fasteners.

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7. The apparatus for molding plastic materials of claim 1 wherein the second gate design mold member is removably attachable to the first or the second mold section by threaded fasteners.

8. The apparatus for molding plastic materials of claim 1 wherein the first gate design is provided by at least two interchangeable mold members (41, 42).

9. The apparatus for molding plastic materials of claim 1 wherein the second gate design is provided by at least two interchangeable mold members.

10. The apparatus for molding plastic materials of claim 1 wherein the first plastic material comprises a thermoplastic polymer.

11. The apparatus for molding plastic materials of claim 10 wherein the first plastic material further comprises a pigment.

12. The apparatus for molding plastic materials of claim 11 wherein the pigment further comprises a light-reflective pigment.

13. The apparatus for molding plastic materials of claim 11 wherein the pigment further comprises a metallic pigment.

14. The apparatus for molding plastic materials of claim 1 wherein the second plastic material comprises a thermoplastic polymer.

15. The apparatus for molding plastic materials of claim 14 wherein the second plastic material further comprises a pigment.

16. The apparatus for molding plastic materials of claim 15 wherein the pigment further comprises a light-reflective pigment.

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17. The apparatus for molding plastic materials of claim 15 wherein the pigment further comprises a metallic pigment.

18. A method for molding plastic articles having pigments used to modify light reflectivity, the method comprising:

providing a mold having a first mold section (12) and a second mold section (14) with a mold cavity (16) disposed between the first and the second mold sections (12, 14);

providing a first gate design;

forming a product in the mold cavity (16) by providing a first plastic material through the first gate design;

separating the first mold section (12) and the second mold section (14);

removing the product from the mold cavity (16);

changing from the first gate design to a second gate design;

forming a product in the mold cavity (16) by providing a second plastic material through the second gate design.

19. The method for molding plastic materials of claim 18 wherein the mold comprises an injection mold.

20. The method for molding plastic materials of claim 18 wherein the first gate design comprises an edge gate.

21. The method for molding plastic materials of claim 18 wherein the second gate design comprises an edge gate.

22. The method for molding plastic materials of claim 22 wherein:

the first gate design is provided by at least two interchangeable mold members;

and

the second gate design is provided by at least two interchangeable mold members.

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23. The method for molding plastic materials of claim 22 wherein at least one of said first or second mold section contains a recess and said first or second gate design is insertable in said recess.

24. The method for molding plastic materials of claim 18 wherein the first gate design mold member is removably attachable to the first or the second mold section by threaded fasteners.

25. The method for molding plastic materials of claim 18 wherein the second gate design mold member is removably attachable to the first or the second mold section by threaded fasteners.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

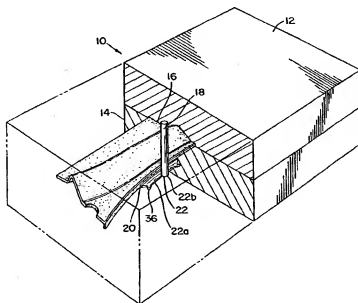
(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
5 April 2001 (05.04.2001)

PCT

(10) International Publication Number
WO 01/23156 A1

- (51) International Patent Classification: B28B 17/00, B29C 47/00
- (21) International Application Number: PCT/US00/26901
- (22) International Filing Date:
29 September 2000 (29.09.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/157,147 30 September 1999 (30.09.1999) US
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chester, NH 03101 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MY,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG,
CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR MOLDING PLASTIC MATERIALS WITH A METALLIC APPEARANCE



(57) Abstract: An apparatus and method for molding plastic materials is provided comprising a mold having a first mold section (12) and a second mold section (14) with a mold cavity (16) disposed in between. A first gate design is provided by at least one first gate design mold member (40), and a second gate design is provided by at least one second gate design mold member. The first and second gate design mold members are removably attachable to, and interchangeable on, at least one of the first or the second mold sections (12, 14) to change from the first gate design to the second gate design.

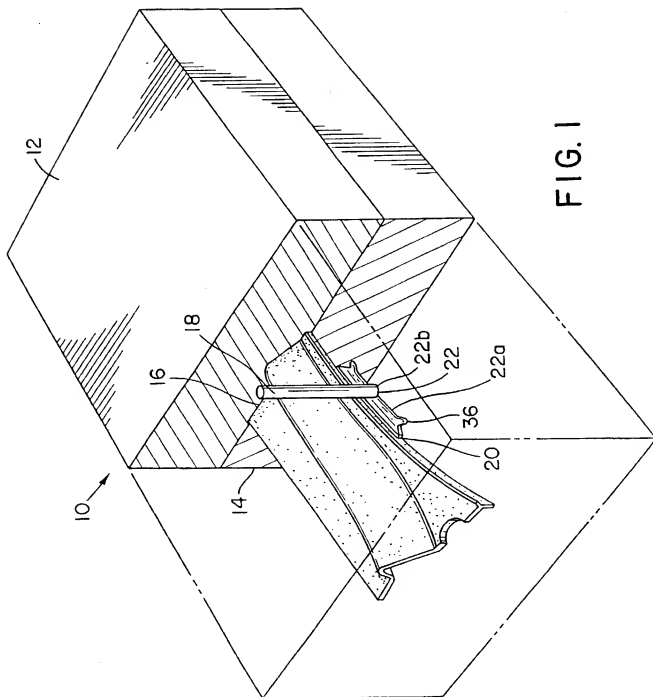


FIG. 1

2/2

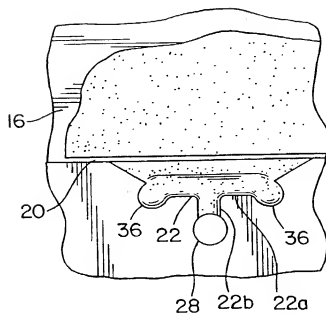


FIG. 2

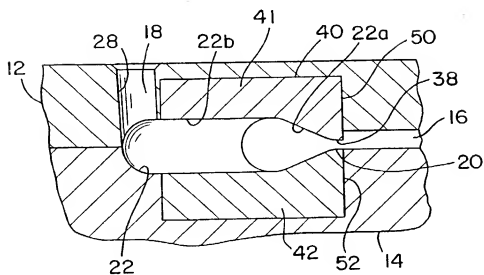


FIG. 3

Docket No.
TRM TR990031

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND APPARATUS FOR MOLDING PLASTIC MATERIALS WITH A METALLIC APPEARANCE

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on I.A.: September 29, 2000 as United States Application No. or PCT International

Application Number 10/089,558

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

(Number)

(Country)

(Day/Month/Year Filed)

☐

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

<u>60/157,147</u>	<u>30 September 1999</u>
(Application Serial No.)	(Filing Date)
 <u> </u>	 <u> </u>
(Application Serial No.)	(Filing Date)
 <u> </u>	 <u> </u>
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

<u>PCT/US00/26901</u>	<u>29 September 2000</u>	<u>pending</u>
(Application Serial No.)	(Filing Date)	(Status)
		(patented, pending, abandoned)
 <u> </u>	 <u> </u>	 <u> </u>
(Application Serial No.)	(Filing Date)	(Status)
		(patented, pending, abandoned)
 <u> </u>	 <u> </u>	 <u> </u>
(Application Serial No.)	(Filing Date)	(Status)
		(patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Steven J. Grossman
Donald J. Perreault
Edmund F. Pfleger
Scott R. Faber

Reg. No. 35,001
Reg. No. 40,126
Reg. No. 41,252
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Full name of sole or first inventor

Paul S. LAEATA

Sole or first inventor's signature

Paul S. Laeata

10/17/02

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Citizenship

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Full name of second inventor, if any

Jack W. HISE

Second inventor's signature

Date

Residence

Citizenship

US

Post Office Address

P.O. Box 312, Ewart, Michigan 49631

Docket No.
TRM TR990031

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Prior Foreign Application(s)

Priority Not Claimed

(Number)

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(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

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4

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(100) Full name of sole or first inventor

Paul S. LAFATA

Sole or first inventor's signature

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Post Office Address

same as residence address

(200) Full name of second inventor, if any

Jack W. HISE

Second inventor's signature

Date

Residence

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Citizenship

US

Post Office Address

P.O. Box 312, Evart, Michigan 49631

Rec'd PCT/PTO 08 OCT 2002

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PATENT
IN THE UNITED STATE PATENT AND TRADEMARK OFFICE

In re application of LAFATA et al

For Method and Apparatus for Holding Plastic Materials
with a Metallic Appearance

Serial Number

10/089,558

Filing Date

September 29, 2000 (effectively from PCT)

Examiner

April 1, 2002

Attorney Docket

TRM TR990031

POWER TO INSPECT AND MAKE COPIES

Honorable Commissioner of
Patents and Trademarks
Washington, DC 20231

Dear Sir:

The undersigned attorney hereby authorizes DIGIPAT, its representatives, Terry Kramer, Jackie Brown, Jon James, Victor Telleria, William Rhodes, Moe Johnson of 2001 Jefferson Davis Highway, Suite 1111, Arlington, Virginia 22202 to inspect and make copies of the file for the above-identified application.

Respectfully submitted,

Attorney Name Steven J. Grossman

Reg. No. 35,001

Attorney for Applicant